IN THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of the Claims:

- (Withdrawn) A compound analysis method, the method comprising determining a vector quantity having a number of dimensions equal to a number of features derived from the electrical output of an electrically active cellular network with each component of said vector being representative of a change in said feature resulting from the application of a compound to said electrically active cellular network and classifying said vector in accordance with a predetermined cluster analysis methodology.
- (Withdrawn) A method as claimed in Claim 1, including providing a library of features characterising known compounds such that classification of said vector enables identification of the compound in accordance with a predetermined measure of statistical reliability.
- 3. (Original) A compound analysis system, the system comprising a micro-electrode array provided by a bio-compatible substrate having a plurality of electrodes situated thereon, said electrodes having an arrangement on said substrate corresponding substantially to that of an electrically active cellular network disposable in use thereon, a multi-channel amplifier coupled to said electrodes and an analyser operatively connected to said amplifier to determine for each active channel a vector quantity having a number of dimensions equal to a number of features derived from the electrical output of said electrically active cellular network with each component of said vector being representative of a change in said feature.
- (Currently amended) A compound analysis apparatus, the apparatus including a processor
 and a memory, the processor being operable in response to signals derived from a microelectrode array connected, in use, thereto, to determine for each channel a vector quantity

having a number of dimensions equal to a number of features derived from the <u>multi-channel</u> electrical output of said micro-electrode array with each component of said vector being representative of a change in said feature, wherein said memory contains a library of features characterising known compounds such that classification of said vector enables identification of a compound deposited, in use, on said array, in accordance with a predetermined measure of statistical reliability.

- (Original) An apparatus as claimed in Claim 4, including a storage device, such that signals derived from said array are held by said storage device.
- 6. (Currently amended) A sensor for compound detection, the sensor comprising a receptacle for a micro-electrode array, said receptacle having a connector for receiving multi-channel electrical signals from said array when received in said receptacle, an amplifier for amplifying said signals and a processor, the processor being operable in response to said signals to determine <u>for each channel</u> a vector quantity having a number of dimensions equal to a number of features derived from the electrical output of said micro-electrode array with each component of said vector being representative of a change in said feature.
- (Original) A sensor as claimed in Claim 6, further including a memory, said memory containing a library of features characterising known compounds such that classification of said vector enables identification of the compound deposited, in use, on said array,
- (Previously Presented) A sensor as claimed in Claim 6 wherein the memory is integral therewith.
- (Original) A micro-electrode array for use in compound analysis, the array comprising a bio-compatible substrate having a plurality of electrodes situated thereon, said electrodes being coupled to a connector, said connector providing, in use, electrical connectivity to

an analysis apparatus, wherein the array further includes a memory coupled to said connector, said memory being accessible, in use, by said analysis apparatus.

- 10. (Withdrawn) A computer program product in a computer-readable medium for use in a compound analysis apparatus, the computer program product comprising determining a vector quantity having a number of dimensions equal to a number of features derived from an electrical output of a micro-electrode array with each component of said vector being representative of a change in said feature, accessing a memory containing a library of features characterising known compounds and classifying said vector in order to identify a compound deposited, in use, on said array.
- (Withdrawn) A computer program product as claimed in Claim 10, including determining a level of statistical reliability applicable to said identification of said compound.

12-13. (Cancelled)

- 14. (New) A compound analysis system according to Claim 3, wherein said analyser is adapted to select a set of channels, and perform feature extraction on each of said selected channels to form a feature set.
- (New) A compound analysis system according to Claim 14, wherein channels with the most frequently occurring non-zero number of spikes are selected.
- (New) A compound analysis system according to Claim 14, wherein extracted feature values are averaged across said feature set.
- 17. (New) A compound analysis system according to Claim 14, wherein the significance of an extracted feature is estimated by calculating the standard deviation of extracted feature values across said feature set.

- 18. (New) A compound analysis system according to Claim 3, wherein said analyser is adapted to determine a vector quantity having components representative of both local and global features across said channels.
- (New) A compound analysis system according to Claim 3, wherein said analyser is adapted to determine a vector quantity having a component representative of the propagation speed of action potentials.